Cloud Lift & Shift and Infrastructure Activities
September 12, 2017
Two path approach for infrastructure

• Lift & Shift
• Cloud Native
Lift & Shift – where we were:

- Goal was to move all Test/Dev VMs from on premise to vCloud Air
- Migration process was established for a smoother relocation
- So far we have moved a little over 200 VMs
- vCloud Air was just a datacenter Layer 2 extension requiring no IP address changes for the VMs
- Allowed for VMs to go back and forth as needed
Lift & Shift – Operational challenges:

- There are challenges with any new deployment
- We worked with our clients to troubleshoot issues
- We had to adjust our procedures in some cases

Lessons learned:

- We should automate our guest VM builds and management
- Aggressive schedule for dev/test ok, prod more measured
Lift & Shift – Operational challenges:

• Because hosts are indistinguishable from on-prem hosts, using on-prem monitoring
• BPPM/Akips/Spectrum
• Existing virtualization platform mgmt tools - vROps/vCenter
• Adding integrations to existing monitoring/notification tools
Cloud Native Infrastructure Dev Terms:

- Gitlab
- Jenkins
- Cloud Formation
- Continuous Integration
- Continuous Delivery
- Continuous Deploy
Gitlab

The platform for modern developers
GitLab unifies issues, code review, CI and CD into a single UI

View Features  Explore Products
Jenkins

Easy to install

Easy to configure

Extensible

That time we met Mr. Jenkins
AWS Cloud Formation

Declarative and Flexible
Infrastructure as Code
Parameterized
CI - Continuous Integration

Source: https://aws.amazon.com/devops/continuous-integration/
CD - Continuous Delivery

jenkins APP 10:23 AM ⭐

- ci-givingprod-build - #4 Success after 2 min 25 sec (Open)
- Build:
  - ENVIRONMENT:production
  - CLUSTER:givingprod
  - REPO:upenn-cloud-first/giving

Code has been pushed to production that requires an approval, please click here to approve [https://jenkins.aws.cloud.upenn.edu:9191/job/ci-givingprod-pipe/4/input](https://jenkins.aws.cloud.upenn.edu:9191/job/ci-givingprod-pipe/4/input)
CD - Continuous Deploy

Source: https://aws.amazon.com/devops/continuous-integration/
Process Evolution
Crawling

You can't automate something you don't fully and completely understand
<table>
<thead>
<tr>
<th>Post-build Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td># Create App Load Balancer</td>
</tr>
<tr>
<td>aws elbv2 create-load-balancer --name $appnameenv-applb --subnets $pubsubnet1 $pub...</td>
</tr>
</tbody>
</table>
Running

```yaml
Service:
  Type: 'AWS::ECS::Service'
  DependsOn:
    - ListenerRule
    - ServiceRole
Properties:
  Cluster: !Ref Cluster
  Role: !Ref ServiceRole
  DesiredCount: !Ref DesiredCount
  TaskDefinition: !Ref TaskDefinition
  PlacementStrategies:
    - Type: spread
      Field: 'attribute:ecs.availability-zone'
    - Type: spread
      Field: instanceId
  LoadBalancers:
    - ContainerName: !Sub '${AWS::StackName}-container'
      ContainerPort: 443
      TargetGroupArn: !Ref TargetGroup
```
<table>
<thead>
<tr>
<th>Session</th>
<th>OS</th>
<th>Browser / Device</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
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<td>23s</td>
</tr>
</tbody>
</table>

Evolve
App Update: Developer perspective
Behind the Scenes

Our Cloud Formation stacks contain some of the following resources:

- Docker ECR Image Repository
- AutoScaling Role
- Utilization Alarms
- Log Groups
- ELB Listener
- Load Balancer
- Load Balancer Security Group
- Scaling Policy
- Service
- Service Role
- Task Definition
- Task Role
Under the Hood – Supporting Infrastructure
Big Deal?!?
Monitoring Native Cloud
Cloud – What’s Next?

Select new technology for disaster recovery/backup
Evaluate and select cloud vendor for production workloads
What’s Next:
Cloud Based Disaster Recovery

• Protection for all platforms – Physical, Virtual, Cloud based
• Support multiple cloud vendors for recovery options
• Multi tenant support – client protection
• Fully automated recovery – click and recover
• Flexible data protection plan
  • Configurable Recovery Time Objectives
  • Configurable Recovery Point Objectives
  • Flexible System recovery – any system, any time
What’s Next:
Cloud and production workloads

• Flexible network configurations
• Configurable HA features for infrastructure
• Capabilities to meet security and compliance requirements
• Simplified system migration
• Full API support for automation
• Extensive 3rd party integration support